

### **REMARKS**

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

#### **Claim Amendments**

Claim 25 has been amended to recite that the packaging material has an inner layer of glycolic acid (co-)polymer, and that the hot water is caused to contain an inorganic electrolyte, thereby preventing opalescence of the inner layer of glycolic acid (co-) polymer during the heat-treatment with hot water. Support for these amendments is found in Applicants' originally filed specification, particularly on page 6, lines 7-10 and page 17, lines 6-8.

Claims 28, 29 and 31-33 have been amended to remove redundancies in the claim language.

Claims 40-42 have been cancelled, without prejudice.

No new matter has been added to the application by these amendments.

#### **Consideration After Final Rejection**

Although this amendment is presented after final rejection, the Examiner is respectfully requested to enter the amendments and consider the remarks, as they place the application in condition for allowance.

#### **Objection to Claim 40**

The objection to claim 40 has been rendered moot by the cancellation of this claim.

#### **Patentability Arguments**

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

**Rejections Under 35 U.S.C. § 103(a)**

The rejection of claims 25-27, 31-33 and 41 under 35 U.S.C. § 103(a) as being unpatentable over Ossian (U.S. 4,818,592) as further evidenced by Moritani et al. (U.S. 4,999,229) in view of Etsuno (JP 58013344), as well as the rejection of claim 42 under 35 U.S.C. § 103(a) as being unpatentable over Ossian, Moritani et al. and Etsuno and further in view of Shikki (U.S. 6,245,437), are respectfully traversed. The Examiner states that Metal's Handbook and Mizutani (U.S. 6,469,085) are cited as evidence.

Applicants note that although claims 28 and 29 are not included in the first sentence of the first rejection, they are discussed in the body of the rejection. Accordingly, these claims are included in the following remarks.

Additionally, Applicants note that claim 42 has been cancelled, and thus, the rejection thereof is rendered moot. However, since claim 25 now recites that the inner layer is glycolic acid(co-)polymer, Applicants include arguments regarding both rejections below.

**The Examiner's Position**

The Examiner takes the position that Ossian teaches heat treatment of a packaged product, wherein the package is filled and sealed, and then subjected to sterilizing conditions, where the outer surface layer is nylon and the inner layer is ethylene vinyl alcohol. The Examiner states that Moritani et al. are cited as further evidence of retort and boiling processes used for sterilization of packaged pouches wherein the pouch comprises ethylene vinyl alcohol as an internal layer.

The Examiner admits that the claims differ in reciting wherein the hot water contains a water-soluble compound and the water soluble compound is an inorganic electrolyte.

The Examiner relies on Etsuno to teach sterilization of a packaged product, wherein a container comprising ham and sausage products is placed in a sterilization bath, and Etsuno adds sodium chloride to the water to increase the speed of sterilization and shorten cooling time.

The Examiner relies on Shiiki as teaching that when a polyglycolic acid film is used in place of a gas barrier resin, the packaging material would be suitable for food and goods which require a treatment under high-temperature and high humidity conditions.

Applicants' Arguments

As discussed above, the inner layer recited in claim 25 has been restricted to glycolic acid (co-)polymer (previously recited in claim 42), and to recite that the inorganic electrolyte prevents opalescence of the inner layer of glycolic acid (co-)polymer during the heat-treatment with hot water.

The presently claimed invention is directed to a heat-treating method for a packaging product, which prevents opalescence of a packaging material having a multi-layer structure including an outer surface layer of at least one hydrophobic resin selected from a specific group and an inner layer of glycolic acid (co-)polymer during hot water treatment thereof. The prevention of opalescence is accomplished by causing the hot water to contain an inorganic electrolyte (as represented by sodium chloride), to suppress the penetration of water through the outer surface layer of hydrophobic resin, and absorption of the water with the inner layer of the glycolic acid (co-)polymer, which leads to opalescence of the packaging material.

Both Ossian (U.S. '592) and Moritani et al. (U.S. '229) disclose boiling or retort treatment of packaged products covered with multilayer packaging materials including a gas-barrier layer of EVOH(ethylene-vinyl alcohol copolymer). As stated above, Applicants' amended claims limit the inner layer to glycolic acid (co-)polymer.

Etsuno (JP '344) discloses the addition of sodium chloride (i.e., an inorganic electrolyte) during retort sterilization of a packaged food (sausage) product for the purpose of elevating the boiling temperature of the retort water (up to, e.g., 103°C) to accelerate the sterilization. It is noted that Etsuno fails to clarify the packaging material.

None of the above-mentioned references disclose or suggest the effectiveness of the addition of an inorganic electrolyte for suppressing the penetration of hot water through a hydrophobic resin layer to prevent the opalescence of an inner glycolic acid (co-)polymer layer or a hydrophilic gas-barrier resin layer.

Metal's Handbook and Mizutani (U.S. '085) disclose the ability of an aqueous solution of sodium chloride as a cooling medium. However, such a function of brine water is not utilized at all in the presently claimed invention, and thus, these references are irrelevant.

Shiiki (U.S. '437) discloses the effectiveness of a glycolic acid (co-)polymer layer as a gas-barrier layer, and the Examiner takes a position that it would have been obvious to one of ordinary skill in the art to replace an EVOH gas-barrier layer with a polyglycolic acid layer for the purpose of improved oxygen and carbon dioxide gas barrier properties. However, the Examiner's assumption ignores a strong prejudice to the boiling or retort hot water treatment of a packaging material including a polyglycolic acid layer.

While polyglycolic acid and EVOH may be both classified as hydrophilic gas-barrier resins, the moisture-sensitivity of polyglycolic acid is much more severe than EVOH because of its hydrolyzability, which is not possessed by EVOH, at all. In fact, a polyglycolic acid layer, when directly exposed to boiling water containing no inorganic electrolyte, is readily hydrolyzed.

In the presently claimed invention, Applicants have solved the problem of severe hydrolyzability of polyglycolic acid layer. The boiling or retort hot water treatment of a packaging material including a polyglycolic acid layer has been realized for the first time by covering the polyglycolic acid layer with a hydrophobic resin layer and by incorporation of an inorganic electrolyte in the boiling or retort hot water for suppressing the mobility of the water.

As mentioned above, Etsuno (JP '344) discloses the addition of sodium chloride during retort sterilization of a packaged food (sausage) product, specifically, the addition of sodium for the purpose of elevating the boiling temperature of the retort water (up to, e.g., 103°C). However, this is a modification for promoting the hydrolyzability of polyglycolic acid. This is completely contrary to Applicants' presently claimed invention, which strives to alleviate the hydrolyzability of the polyglycolic acid layer, and thus prevent opalescence of the layer. Accordingly, one of ordinary skill in the art would not look to the teachings of Etsuno as a motivation to add sodium chloride in the boiling or retort hot water treatment for a packaging material including a polyglycolic acid layer, especially for alleviating the hydrolyzability of the polyglycolic acid layer.

In summary, Ossian and Moritani et al. fail to teach the use of glycolic acid (co-) polymer as the inner layer of the packaging material. Further, although EVOH and glycolic acid (co-) polymer may both be considered hydrophilic gas barrier resins, the properties of

the two resins are quite different, as polyglycolic acid has severe hydrolyzability. Further, although Etsuno to disclose the addition of sodium chloride during sterilization of a packaged food, the purpose of this addition is to promote the hydrolyzability of polyglycolic acid. On the contrary, Applicants' presently claimed invention recites a heat-treating method for a packaging product, wherein the packaging material comprises a multi-layer structure, where the inner layer is glycolic acid (co-) polymer, and wherein the hot water use to heat-treat the packaging product is caused to contain an inorganic electrolyte, thus preventing opalescence of the inner layer during the heat treatment.

The function of Applicants' recited inorganic electrolyte, when added to the boiling or retort hot water, to suppress the mobility of water for penetrating through a hydrophobic resin layer is not taught or suggested by any of the cited references, including Etsuno. Additionally, Applicants respectfully assert that the teachings of Shiiki, which simply teach the excellent gas-barrier property of a polyglycolic acid layer, do not remedy the deficiencies of the references discussed above.

For these reasons, the invention of Applicants' pending claims is clearly patentable over Ossian, Moritani et al., Etsuno and Shikki.

**Conclusion**

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

Kazuyuki YAMANE et al.

By: 

Amy E. Schmid  
Registration No. 55,965  
Attorney for Applicants

AES/nrj  
Washington, D.C. 20006-1021  
Telephone (202) 721-8200  
Facsimile (202) 721-8250  
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